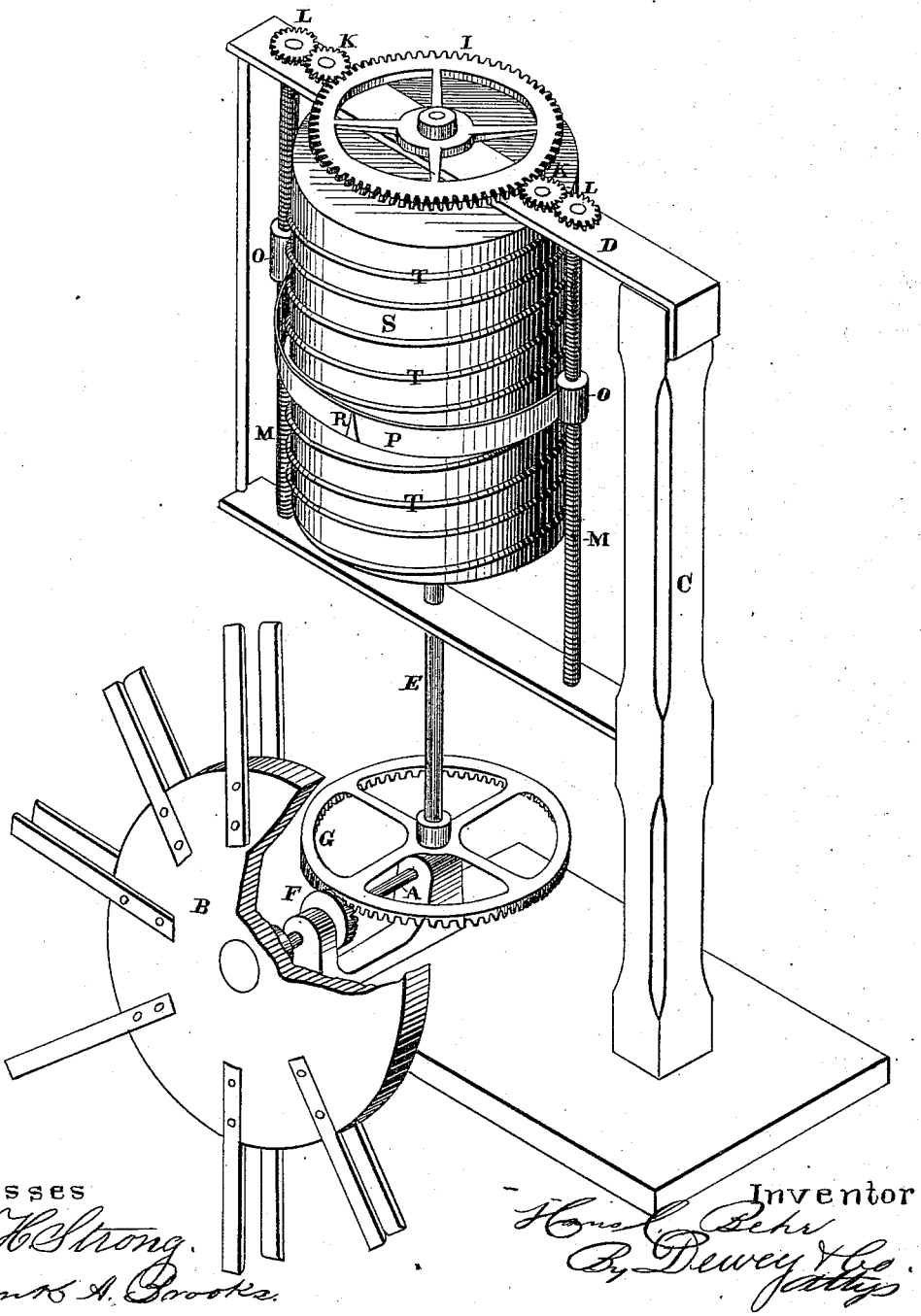
H. C. BEHR.

Hoisting Register.

No. 211,883. Patented Feb. 4, 1879.



Witnesses

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UNITED STATES PATENT OFFICE.

HANS C. BEHR, OF VIRGINIA CITY, NEVADA.

IMPROVEMENT IN HOISTING-REGISTERS.

Specification forming part of Letters Patent No. **211,883**, dated February 4, 1879; application filed October 28, 1878.

To all whom it may concern:

Be it known that I, HANS C. BEHR, of Virginia City, county of Storey and State of Nevada, have invented an Indicator for Winding-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to that class of indicators which ~~are~~ used in hoisting or winding engines to indicate to the engineer the position of the cage or other object being hoisted or lowered; and my improvements consist in mounting a drum, carrying a helix, on a shaft which is operated by the main shaft on which the reel carrying the rope and cage is mounted, or by the reel directly, said helix having marks or numbers on it corresponding to the position of the cage in the shaft.

The revolution of the shaft-carrying drum and helix operates two screw-shafts, which carry an indicating-bar and pointer, said bar and pointer moving in a plane in the direction of the axis of the drum, and following the helix, so as to point out the position of the cage on the end of the rope in the main shaft.

It is well known that in the case of winding-engines in mining operations frequent accidents occur from the impossibility of the engineers knowing with accuracy exactly the position of the cage in the shaft, and it is moreover difficult to stop the engine at exactly the moment when the cage is at the desired point.

Numerous devices have been applied to overcome these difficulties; but none of them work with sufficient accuracy. Most of them indicate the point when the cage is at different levels; but their variation is so great that it is impossible to tell within four or five feet the exact position which the cage occupies in the shaft. My device is intended to overcome this, and indicate at all points in the shaft the exact position of the cage or other object being hoisted or lowered.

Let A represent the main shaft of the hoisting-engine, which is mounted on the journal on the pillow-blocks; and B, the reel, on which the wire rope or cable attached to the cage is wound.

On the foundation, at the end of the main shaft A, is placed a vertical standard, C, which supports the improved indicating apparatus. A horizontal arm, D, at the upper end of this standard, has a journal, in which the upper end of the vertical shaft E revolves, said shaft having also a bearing at its lower end, as shown. On this vertical shaft E is secured a drum cone or cylinder, S, having a spiral thread, T, formed on it, said drum or cylinder revolving as the shaft revolves. The revolution of this shaft is accomplished by the pinion F in the end of the horizontal main shaft A engaging with the gear G on the vertical shaft E. On the upper end of the vertical shaft E is a gear, I, which meshes with the gears K on each side of it, and they in turn engage with the pinions L on the upper end of the screw rods or shafts M, as shown. These screw-shafts M are revolved from the shaft E by the gears I, K, and L. On each of these shafts is an internally-threaded sleeve or nut, O, to which is attached the curved indicating-bar P, said bar being fastened by its ends to the two sleeves O. On this indicator-bar is the pointer R, placed in the center, as shown.

The operation of my device is as follows: The drum or cylinder, having the helix around it, has marks or numbers formed on the helix, which indicate certain points in the mine-shaft. It may be marked off by stations or by feet, as desired. As the drum is revolved by the pinion on the reel-shaft actuating the vertical shaft on which said reel is mounted, the gearing described actuates the screw-shafts M, and the sleeves carry the indicating-rod and pointer up or down, as the case may be. The pointer will then indicate, by the marks on the helix on the drum, the position of the cage in the mine-shaft. As one foot on the helix will indicate, for instance, every ten feet of rope or cable, and as the drum is revolved by the shaft on which the reel carrying the rope attached to the cage is mounted, it will be evident that the pointer will indicate exactly on the helix the point at which the cage is at any particular time. This method of indicating the position of a cage in a shaft furnishes a reliable means of accomplishing the object. The pointer moves in a plane in the direction of the axis of the drum, and follows the helix accurately.

It will readily be seen that various modifi-

cations of the operating mechanism can be made, such as a worm-gear; and the indicator-spiral may also be made upon a frustum of a cone, so that the gradual enlargement or diminishing of the circumference of the reel, on account of the amount of wire rope, will be compensated for upon the indicator, the prominent feature of the device being to obtain a clear, exact, and well-spaced indicator without making it so bulky as any flat arrangement would have to be.

The stretch of cable, when out at great length, may be calculated for on the helix, and the marks changed in accordance with the stretch of rope after a time. The accuracy of the device is such that the engineer can tell to a foot exactly the position occupied by the cage in the shaft. By this means liability of accident is overcome, and the cage can always be stopped at exactly the desired point.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The mechanism herein described for operating the drum and indicator, consisting of the gear and pinion F G, and the screws M, and driving-gears I K L, combined and arranged substantially as herein described.

2. The drum S, having its periphery marked and divided as shown, said drum being mounted upon a shaft, which is actuated so as to rotate in unison with the rotation of the winding or cable drum of a hoisting apparatus, in combination with the indicator P R, which is moved by the screws M, or equivalent means, parallel with the axis of the drum, substantially as and for the purpose herein set forth.

In witness whereof I have hereunto set my hand.

HANS C. BEHR.

Witnesses:
GEO. H. STRONG,
FRANK A. BROOKS.